Algebra III Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

More Applications of Logs HW Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solve for x.

1. Bacteria of a certain type can grow from 80 to 164 bacteria in 3 hours. Find *k* for the growth formula.

2. For a certain strain of bacteria, *k* is 0.782 when *t* is measured in hours. How long will it take 10 bacteria to increase to 500 bacteria?

3. Mr. Winters has $2500 to invest. If he hopes to have $5000 after 8 years, what interest rate is needed, assuming continuous compounding?

4. A piece of machinery valued at $50,000 depreciates 10% per year by the fixed rate method. After how many years will the value have depreciated to $25,000?

5. Electronic equipment valued at $150,000 depreciates 20% per year by the fixed rate method. After how many years will the value have depreciated to $15,00?

6. Radium-226 decomposes radioactively. Its half-life (the time half of the sample takes to decompose) is 1800 years. Find the constant *k* for the decay formula. Use 100 grams as the original amount.

7. Mike has $500 in his savings account. He is spending 10% of the balance each week. After how many weeks of this spending will the balance be under $1? Use  where *n* is the number of weeks.

8. Sara deposited $650 in an account that earned 12% interest compounded monthly. The account contained $2500 when she withdrew her money. How long was the money in the account?

9. Ms. Fleming has $8000 to invest and wants to open her Snowball Stand in 5 years. Start up costs for the stand are $15,000. What interest rate (compounded quarterly) will she need to earn that much?

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